UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/035,796	12/31/2001	Christopher J. Rust	1.900.1	3866

26000 7590 04/10/2003

HENRY E. NAYLOR
11750 S . HARRELLS FERRY RD
SUITE A
BATON ROUGE, LA 70817

EXAMINER
LARKIN, DANIEL SEAN

ART UNIT	PAPER NUMBER
2856	

DATE MAILED: 04/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/035,796	Applicant(s) RUST
	Examiner Daniel Larkin	Art Unit 2856

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *THREE (3)* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☐ Responsive to communication(s) filed on _____.

2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-10* _____ is/are pending in the application.

4a) Of the above, claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☐ Claim(s) _____ is/are rejected.

7) ☒ Claim(s) *1-10* _____ is/are objected to.

8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9) ☒ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on *31 Dec 2001* is/are a) ☐ accepted or b) ☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some* c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____
4) ☐ Interview Summary (PTO-413) Paper No(s). _____
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the multiple sampling valves, sampling means, columns, and heaters, as recited in claims 1-4, 6, and 10, must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

The drawings fail to provide a showing of any duplication of structure or parallel configuration of the columns.

2. Applicant is required to submit a proposed drawing correction or corrected drawings in response to this Office Action to avoid abandonment of the application. Any proposal by the Applicant for amendment of the drawings to cure defects must consist of two parts:

a) A *separate* letter to the Draftsman in accordance with MPEP § 608.02(r); and

b) A print or pen-and-ink sketch showing changes in *red ink* in accordance with MPEP § 608.02(v).

IMPORTANT NOTE: The filing of new drawings to correct the noted defect may be deferred until the application is allowed by the Examiner, but the print or pen-and-ink sketch with proposed corrections shown in red ink is required in response to this Office Action, and *may not be deferred.* The objection to the drawings will not be held in abeyance.

Specification

3. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which Applicant may become aware in the specification.

4. The disclosure is objected to because of the following informalities:

Page 6, text line 21: The term "in" should be corrected to read -- is --.

Page 7, text line 6: To what does the term "it" refer?

Page 7, text line 12: The sentence "Also, gas chromatograph is well known is described in..." does not make sense.

Page 8, text line 9: The article -- the -- should be inserted prior to the term "other"; or the term "other" should be replaced with the term -- another --.

Page 14, text line 11: The numeral "3" should be corrected to read -- three --.

Page 15, text line 22: The term "unexpected" should be corrected to read -- unexpectedly --.

Page 15, text line 23: The numeral "2" should be corrected to read -- two --.

Page 15, text line 24: The numeral "3" should be corrected to read -- three --.

Page 16, text line 2: The term "with" should be corrected to read -- without --.

Page 16, text line 8: The numeral "6" should be corrected to read -- six --.

Page 20, text line 2: The numeral "10" should be corrected to read -- ten --. Appropriate correction is required.

Claim Objections

5. Claims 3 and 4 are objected to because of the following informalities:

Re claim 3, claim line 1: The phrase "that contains" is improper. Some other phrase that allows for better understanding should be provided. For instance, the phrase -- further comprising -- could be used.

Re claim 4, claim line 1: The term "to" should be corrected to read -- two --; and the term "column" should be made plural. Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re claim 1, claim line 11: Which "said housing" is being recited here, the first housing or the second housing?

Re claim 1, claim line 18: The phrase "said first enclosed compartment" lacks antecedent basis.

Re claim 8, claim line 2: The phrase "the oven compartment" lacks antecedent basis.

Re claim 8, claim line 3: The phrase "the carrier gas linear velocity" lacks antecedent basis. No mention of a carrier gas has been previously recited.

Re claim 8, claim line 4: The phrase "the column or detector" lacks antecedent basis. The phrase has been interpreted as 'the column or the detector'; and no previously mention of a detector has been recited.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 1, 2, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,453,725 (Dahlgren et al.) in view GB 1089642.

With respect to the limitation of claim 1, the reference to Dahlgren et al. discloses a gas chromatograph sample and column-switching valve, as shown in Figure 2, an oven (46) having sample inlets (32a) and outlets (32b) into the oven, a multi-port valve (32) having sample inlets (1) and outlets (2) that correspond to the inlets (32a) and outlets (32b) through the oven, a fixed volume sampling loop (32c) which is integral with the sampling valve (32); two chromatograph columns (36, 38) fluidly connected to the sampling valve (32). A multi-celled detector (34) is provided to detect the various constituents separated in the columns. Although not shown, the Examiner argues that a heater and an actuating mechanism associated with the sampling valve

(32) are inherent to the functionality of the invention since a heater is needed for the oven, and some actuating means is necessary to allow the multi-port valve to perform its sampling function. The reference to Dahlgren et al. fails to show placement of the oven within an exterior housing. The reference to GB 1089642 discloses an apparatus used in gas chromatography comprising a furnace (3) holding a multi-port sampling block (13), a sampling volume (27) integral with the sampling block (13), and two columns (7, 8); the furnace (3) further being located within an outer casing (1). A heating system is provided within the spacing between the casing (1) and the furnace (3). The sampling block (13) is provided with a rotating plate (10') actuated by a lever (9) which allows the various fluids to be process through the sampling block (13). Providing an outer casing for the oven would have been obvious to one of ordinary skill in the art as a means of allowing adequately control the temperature of the apparatus as well as allow one to provide extra protection when analyzing explosive components.

With respect to the limitation of claim 2, the reference to Dahlgren et al. fails to disclose a column train. The reference to GB 1089642 disclose that a sample is passed through a first column (8) and then a second column (7), i.e. the columns are in series, page 3, lines 2-6. Providing columns in series would have been obvious to one of ordinary skill in the art as a means of more accurately detecting specific constituents by allowing multiple separations of the same sample.

With respect to the limitations of claim 8, the Examiner argues that this limitation is a choice of design which is obvious to one of ordinary skill in the art as a way of maximizing

efficiency of the analyzer. One would not want to provide components which would jeopardize the operating efficiency of the analyzer or would cause measurement inaccuracies.

9. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,453,725 (Dahlgren et al.) in view GB 1089642 as applied to claim 1 above, and further in view of US 6,474,136 (Nishina et al.).

The references to both fail to disclose multiple sampling valves. The reference to Nishina et al. discloses an apparatus for analyzing impurity components comprising two sampling valves (61, 71) and two columns (62,72). Providing two sampling valves would have been obvious to one of ordinary skill in the art as a means of allowing more samples to be analyzed more effectively than sampling through a single multi-port valve.

10. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,453,725 (Dahlgren et al.) in view GB 1089642 as applied to claim 1 above, and further in view of US 6,227,034 (Trochesset).

The references to Dahlgren et al. and GB 1089642 both disclose the use of two columns; however, each reference fails to expressly state that the columns are configured in parallel with each other. The reference to Trochesset discloses an integrated valve design for a gas chromatograph wherein the chromatograph is provided with a multi-port sampling valve (300), a sampling loop (315) integral with the sampling valve (300), and two chromatograph columns

(220). The reference discloses that the two columns (220) may be configured to be in parallel with each other. Providing columns which are in parallel with each other would have been obvious to one of ordinary skill in the art as a means of increasing the speed of analysis than can be achieved through serial analysis.

11. Claims 5, 7, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,453,725 (Dahlgren et al.) in view GB 1089642 as applied to claim 1 above, and further in view of US 5,338,514 (Morabito et al.).

The references to Dahlgren et al. and GB 1089642 both all disclose analyzers that utilize a plurality of chromatograph columns, however, neither of the references suggest at least one capillary column. The reference to Morabito et al. discloses a vented capillary gas chromatography apparatus comprising an oven (43), a multi-port sampling valve (27), a capillary column (16), and a detector (17) mounted outside of the oven (43). Providing a capillary gas chromatograph column would have been obvious to one of ordinary skill in the art because capillary columns are well known in the art to separate constituents.

12. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,453,725 (Dahlgren et al.) in view GB 1089642 as applied to claim 1 above, and further in view of US 6,227,034 (Trochesset) and US 5,338,514 (Morabito et al.).

The references to Dahlgren et al. and GB 1089642 both disclose the use of two columns; however, each reference fails to expressly state that the columns are configured in parallel with each other. The reference to Trochesset discloses an integrated valve design for a gas chromatograph wherein the chromatograph is provided with a multi-port sampling valve (300), a sampling loop (315) integral with the sampling valve (300), and two chromatograph columns (220). The reference discloses that the two columns (220) may be configured to be in parallel with each other. Providing columns which are in parallel with each other would have been obvious to one of ordinary skill in the art as a means of increasing the speed of analysis than can be achieved through serial analysis.

As to the limitation of providing at least one capillary column, the references to Dahlgren et al., GB 1089642, and Trochesset all disclose analyzers that utilize a plurality of chromatograph columns, however, none of the references suggest at least one capillary column. The reference to Morabito et al. discloses a vented capillary gas chromatography apparatus comprising an oven (43), a multi-port sampling valve (27), a capillary column (16), and a detector (17) mounted outside of the oven (43). Providing a capillary gas chromatograph column would have been obvious to one of ordinary skill in the art because capillary columns are well known in the art to separate constituents.

13. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,453,725 (Dahlgren et al.) in view GB 1089642 as applied to claims 1 and 7 above, and further in view of

US 5,338,514 (Morabito et al.), US 6,227,034 (Trochesset), US 5,049,509 (Szakasits et al.), and US 5,435,169 (Mitra).

The references to GB 1089642 and Morabito et al. both fail to disclose providing a gas chromatograph which utilizes two detectors, one a flame ionization detector, and a thermal conductivity detector. The reference to Dahlgren et al. discloses a chromatograph which uses a multi-celled detector (34) having at least four sensors (34a-34d). The reference does not say type of sensor this is.

The reference to Trochesset discloses an integrated valve design for a gas chromatograph wherein the chromatograph is provided with a multi-port sampling valve (300), a sampling loop (315) integral with the sampling valve (300), two chromatograph columns (220), and two thermal conductivity detectors. The reference to Szakasits et al. discloses a chromatographic analyzer comprising a multi-port sampling valve (50), a sample loop (27), multiple columns (100, 200, 300, 400), and multiple flame ionization detectors (202, 302, 402). The reference to Mitra discloses a device for monitoring volatile organic compound comprising a multi-port valve (12), a sampling loop (13), a column (17), and a detector (15). The reference to Mitra states, col. 2, lines 29-33, that any number of detectors can be used including GC detectors of the type, such as thermal conductivity detectors and flame ionization detectors, to just name two. This teaching would appear to suggest that any of these detectors would accurately detect the volatile organic compounds present in the sample, and that one of ordinary skill in the art would recognize the advantages of one detector over any other detector based upon the specific measuring parameters

needed. Furthermore, providing a chromatograph utilizing different detectors would have been obvious to one of ordinary skill in the art as a means of maximizing accuracy of detection by allowing one of ordinary skill in the art to take advantage of the benefits of utilizing one detector over another in combination with the benefits provided by utilizing a second, and different detector.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure.

The prior art to US 4,553,985 (Dahlgren et al.) discloses a gas chromatograph comprising a casing separated into two compartments with a heated upper portion containing multiple multi-port sampling valves, and a chromatograph column (4).

The prior art to US 3,069,894 (Claudy) discloses a chromatographic sampling system comprising an oven containing a sampling valve (18), a sampling loop (20), and a chromatograph column (24).

The prior art to US 5,447,556 (Pleil et al.) discloses a sample injection apparatus that utilizes an oven enclosure contained within a cabinet enclosure.

The prior art to US 6,365,105 (Waters et al.) discloses a fluid handling apparatus comprising a multi-port sampling valve, multiple sampling loops, and multiple columns.

The prior art to US 5,071,547 (Cazer et al.) discloses a dual column chromatographic apparatus.

The prior art to US 6,004,514 (Hikosaka et al.) discloses a gas chromatographic apparatus comprising a temperature regulated enclosure located within an explosion proof casing.

15. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Daniel Larkin whose telephone number is (703) 308-6724. The Examiner can normally be reached on Monday-Friday from 7:00 AM - 4:00 PM.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Hezron E. Williams, can be reached on (703) 305-4705. The FAX telephone number for this Technology Center (TC 2800, unit 2856) is (703) 308-7382.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0956.

Daniel Larkin

5 April 2003

DANIEL S. LARKIN
PRIMARY EXAMINER